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ABSTRACT

The General National Vocational Qualification (GNVQ) in engineering was piloted in about 100 centers and with over 3,000 students in British further education colleges during 1994-95. A small-scale project monitored the introduction of the GNVQ in engineering in eight colleges: three each in the north and south and two in the Midlands. Findings indicated that college staff welcomed the engineering GNVQ because it provided a broad-based engineering qualification, and they were convinced of the potential of the GNVQ to provide an alternative to existing vocational qualifications in engineering in the near future. Demand for places from applicants who were likely to succeed on the Advanced GNVQ program needed to be stimulated. Successful induction programs were those that provided opportunities for students to experience problem-centered learning strategies and were spread over the course. Early planning and preparation of vocational and core skill assignments, assessment, and curriculum delivery contributed to the success of the GNVQ program. Small teams delivering the GNVQ in engineering were able to meet frequently, communicate effectively, and deliver a comprehensive and integrated program. Employers still needed to have their awareness raised regarding the vocational relevance of the GNVQ in engineering. Recommendations were made regarding recruitment, induction, course structure, work relevance, course assessment, and program planning. (YLB)

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# Engineering the future: monitoring the pilot GNVQ in Engineering

The GNVQ in Engineering was piloted in about 100 centres and with over 3,000 students during 1994-5. FEDA undertook a small-scale project to monitor the introduction of the GNVQ in Engineering in eight English colleges: three each in the north and south and two in the Midlands.

The two colleges in the Midlands were also involved in a companion project looking at the prototype phase of Modern Apprenticeships (see forthcoming bulletin *Back to the Future*). They were developing both the GNVQ and the Modern Apprenticeship in Engineering in partnership with a major car manufacturer.

The colleges chosen for this project had registered all their students with BTEC. Colleges had students registered for the GNVQ Engineering at either or both Intermediate and Advanced levels. Those students on the Advanced programme had not completed their studies by the end of this project. Entry requirements for the Intermediate

Engineering programmes were generally more flexible than those for the Advanced programme, for which at least four GCSEs at Grade C, including Mathematics and Science were required. No college defined their course entry requirements in terms of core skills, although most colleges in the project placed high value on evidence of technology-related hobbies and interests. Students with merits or distinctions in the BTEC First Diploma in Engineering were also recruited. Two of the northern colleges had each recruited a mature student into the Advanced programme. The issue of entry criteria and their link to successful outcomes on GNVQ programmes has been the subject of another FEDA project, Entry Criteria for GNVQs (RP839).

Entrants to the two colleges linking the introduction of GNVQ Engineering with the development of Modern Apprenticeships were higher achievers on entry into the programme. While other colleges in the Midlands and the south achieved their recruitment targets, the northern colleges experienced difficulty in meeting their targets, particularly in the Advanced programme. One explanation for this was that the GNVQ was perceived as less attractive than the more focused and well-established BTEC National Diploma in Electronic Engineering.

Another significant factor was the relationship between the colleges and schools. It seems that relationships between colleges and schools, previously beneficial and productive, have been deteriorating as institutions compete for students. Staff in the project colleges, however, retained their faith in collaboration. Indeed, one college has adopted a policy to encourage schools to deliver GNVQs at Intermediate level in Manufacturing and Engineering with a view to expanding its own Advanced provision.

Another college was in partnership with four schools and a local employer. The college is delivering GNVQ units at Intermediate level in Manufacturing to Years 10 and 11 school pupils on college premises. The pupils also undertake a relevant work placement and if successful, are guaranteed a place on GNVQ Advanced Engineering.

FEDA has previously undertaken research on the extent and effectiveness of partnership and collaboration in the provision of post-compulsory initiatives, including Partnership in Continuing Education (RP371) and Collaborative Arrangements Post-Incorporation (RP795). The project on collaboration in GNVQs highlighted the general advantages of partnership in seeking to provide a range of GNVQs at all levels (GNVQs and Collaboration, RP754b).

Selection and recruitment on to both Intermediate and Advanced GNVQs in Engineering were supported by innovatory and flexible induction programmes. These were successful in developing positive attitudes toward both engineering and learner autonomy, as well as informing students of the assessment requirements and evidence gathering process.

## Course planning and structure

In the pilot, colleges had two different strategies for deciding the composition of the course team for GNVQ Engineering. One strategy involved as many staff as possible from an early stage and offered them the maximum opportunity to be trained in GNVQ delivery and assessment requirements. This proved important in engineering departments that had no intuitive feel for the philosophy of GNVQ. The second strategy was designed to build on the enthusiasm of a few members of a department. This ensured a higher degree of control over the process and the flexibility required for a pilot. Because of uncertainties and contractual disputes at the time, the latter approach was preferred.

Whatever the approach, it is important to develop staff before detailed programme

planning and allocating the time for planning and designing the programme. A number of staff involved in the project had already acquired NVQs in assessor training (D32/D33), but this was of limited use for GNVQ assessment.

Internal verifiers have an important role to play in supporting the course team — not only for their authoritative input on assessment, evidence accumulation and grading — but in helping design the course so that the assessment requirements are efficiently and effectively delivered. It was also found that the earlier external verifiers could be appointed, the better, especially if they had significant experience.

In designing the courses, the assumption was that the students would be young school leavers wishing to study full-time for a vocational rather than an academic qualification. However, in some colleges, particularly those in the north, there was significant demand for a part-time study route and from mature students. These colleges reported having difficulties in integrating part-time with full-time provision, making it difficult to run viable National Certificate courses alongside the GNVQ Advanced in Engineering. These colleges were aware that the current government policies on lifelong learning would be likely to increase the demand for non-standard modes of study from mature learners and were looking at ways of approach-ing the situation in a more flexible manner.

Colleges taking the opportunity to introduce GNVQ units on a semester basis experienced difficulties during the pilot year in terms of programming and sequencing the vocational and core units. The results were low pass rates and student complaints that the course was difficult and boring. The experience led course teams both to consider more carefully the delivery of vocational and core units, and spreading Mathematics and Science units throughout the year.

Guided learning hours varied between 15 and 23, spread over two and a half to five days per week. The variations were due to differences in approach to additional studies. Most course teams reported difficulties in delivering the programme requirements during the time available, particularly the Mathematics units. Proposed revisions to GNVQ units should reduce this problem.

The exceptions were those colleges where schedules had been very carefully considered and the on- and off-the-job learning were integrated and co-ordinated. However, perhaps this worked well because of the employed status of the students, the specific requirements of the motor manufacturing company and its inputs into course design, delivery and assessment.

### Relevance to work

Like any vocational award, the relevance of the GNVQ Engineering to the world of work is vital. Yet during the pilot, employer involvement in programme planning and design was limited, the exception being the car manufacturer involved in the Modern Apprenticeships. In this model, company training staff worked closely with college staff not only to design the programme, but to assist in its delivery and assessment, including induction and assessor training. The students, or apprentices, recognising this close co-operation, were reported to have confidence in the course and to be well motivated.

Colleges sought to provide GNVQ Engineering students with work placements lasting two to three weeks. Where this happened, they were highly valued by the students as both a learning experience and an opportunity to get into regular employment. However, such work placements require considerable planning and organisation, and the added value is not always obvious to college management.

### Curriculum breadth

The particular attraction of GNVQ Engineering for a college is that it offers a broader curriculum than the existing vocational awards or qualifications. College staff believed that this breadth enables the colleges to compete more



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equally with schools for 16 year olds who want to stay in full-time education but are uncertain about a specific career or whether to go into higher education (HE). GNVQs allow them to keep their options open.

Some staff have expressed concern that GNVQ Engineering will not be an adequate replacement for the successful BTEC National in Electronics. Indeed, students seem to be looking for specialist rather than general awards. It is, of course, possible to offer additional units alongside a GNVQ Engineering, to satisfy student demand for a more specific electronics content.

### Core skills

Information technology (IT) is usually taught and assessed separately. This is more to do with availability of computer resources than curriculum design. Students are encouraged to use IT to support other learning and assignment work, but there was little evidence of this happening, except in the case of Modern Apprentices.

Opportunities for the exercise and assessment of Communication Skills and Application of Number were generally provided in assignments relating to vocational units. Tutors tended to offer constructive feedback where literacy or numeracy skills appeared deficient. While some colleges used specialist communications skills staff to deliver discrete units, there was generally little effort to improve core skills, unless there was a referral to learning support.

Course teams were in favour of integrating non-mandatory core skills, but with the priority given to mandatory units there was little incentive to develop of these units. Students were often encouraged to work in groups, but this skill was rarely recorded or assessed.

Dividends were reaped when core skills were fully contextualised in Engineering. This was made possible by having an Engineering lecturer with a tutorial or support role in relation to core skills.

Difficulties with Application of Number could be integrated into the delivery of discipline-related mathematics skills and knowledge.

### Recording achievement

All colleges had systems for recording and tracking core skills and unit achievement, which were usually based on adaptations of models recommended by the awarding body.

College-wide strategies for recording achievement also influenced the way in which these systems were designed and used.

Portfolios played an important part in recording achievement. Students were guided into portfolio development through the induction process. However, some practical difficulties arose due to assignments being completed unsatisfactorily or late.

## Summary of key findings

- College staff welcomed the Engineering GNVQ because it provided a broad-based engineering qualification.
- College staff are convinced of the potential of the GNVQ to provide a quality alternative to existing vocational qualifications in engineering in the near future.
- Demand for places from applicants who were likely to succeed on the Advanced GNVQ programme needed to be stimulated. This is likely to require an improvement in relationships and more collaboration between schools and colleges.
- Successful induction programmes were those that provided opportunities for students to experience problem-centred learning strategies and were spread over the course.

- Transition to a student-centred approach to learning was an important function of induction programmes.
- Early planning and preparation of vocational and core skills assignments, assessment and curriculum delivery contributed to the success of the GNVQ programme. It is important that sufficient time is allocated for this preparation.
- Assessment of course work assignments was thought to be more successful if it was formative as well as summative.
- Small teams delivering the GNVQ in Engineering were able to meet frequently, communicate effectively and deliver a comprehensive and integrated programme.
- Where the GNVQ programme was tied to Modern Apprenticeships, there was effective and more relevant use of workplace learning, meeting the needs of both employers and students.
- Employers still need to have their awareness raised regarding the vocational relevance of the GNVQ in Engineering; one strategy is to involve them in programme development and delivery, as well as encouraging them to provide workplace learning opportunities.

## Recommendations

### Recruitment

- Students recruited to Advanced level GNVQ Engineering are more likely to be successful if they have GCSEs in Mathematics and Science at Grade C or above.
- Collaboration with schools in the delivery of GNVQs is a means of enhancing the quality of recruits to GNVQ Engineering, especially at Advanced level.
- Colleges should consider the equal opportunity implications of their patterns of recruitment to GNVQ Engineering.

### Induction

- Students need to be prepared for a student-centred approach to learning, as well as to be introduced to the requirements of assessment and processes of action planning, portfolio building, assessment requirements and evidence gathering.
- Colleges should consider the advantages of extended induction programmes to allow diagnostic assessment and introduction to learning support opportunities.

### Course structure

- Mathematics and Science units need to be delivered over the academic year.
- Attendance will be improved if timetabling is 'tight', that is, over four rather than five days.
- Programmes should retain flexibility to meet student demand for more specific awards and qualifications.
- Core skills should be integrated into the Engineering units, and assessed through those units.

### Work relevance

- Colleges should actively seek employer involvement in programme development, assignment design and assessment of workplace learning.
- Colleges should continue to update their course materials to ensure that recent materials which relate GNVQs to industrial contexts and employment opportunities are used, especially in Engineering.
- Given the perceived value of work placements, colleges should develop strategies to ensure that most students have the opportunity for relevant work experience.



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## COURSE ASSESSMENT

- Course teams should consider how they might improve the efficiency of assessment, including ensuring access to experienced verifiers.
- The timing of entering students for external tests and what support to give those who need to resit them should be carefully considered.
- Feedback on course-work assessment should be given promptly so that students are aware of the criteria, the standards required and their progress toward achieving the award.

## PROGRAMME PLANNING

- The course team members should have sufficient collective expertise to deliver the GNVQ Engineering programme effectively at the appropriate level.
- The course team should be sufficiently small to facilitate communication and expedite meetings.
- The course team and college management should carefully consider their policies on GCSE resits alongside the GNVQ programme.

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**Note**: FEDA will shortly be publishing further work on good practice in Engineering in FE.

## PROJECT COLLEGES

The FE colleges which took part in this FEDA project were:

Bradford and Ilkley Community College, Burnley College, Bury Metropolitan College, East Birmingham College, Mid-Warwickshire College, Milton Keynes College, Peterborough Regional College, Southgate College

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